

Guidelines for accessible learning resources for *all* students



engage

**Government
of Alberta ■**

Introduction

Diversity has become one of the defining features of Alberta's schools. Diversity and diverse learners describes the wide range of abilities, interests, backgrounds, languages and cultures reflected in classrooms today. Responding effectively to student diversity demands innovative solutions, strategic planning and collaborative development.

To better meet the needs of all students in Alberta schools, including students with disabilities, teachers and students need learning resources that are accessible. The term accessibility refers to how easily, how effectively and how independently an individual student can use the resource. Resources with flexible formats give students the choice, control and independence they need to be successful in their learning. Flexible resources also give teachers the tools they need to better meet the diverse needs of all students in their classrooms. Accessible resources will also support the concept of Anywhere, Anytime, Any pace learning.

The following guidelines for accessible resources have been developed to inspire the development and selection of resources that will improve learning opportunities for all students in Alberta. These guidelines go beyond the international standards for baseline accessibility and incorporate the extensively researched components of Universal Design for Learning (Center for Applied Special Technology (CAST) 2008) and related research, including Lynne Anderson-Inman and Mark A. Horney's work on supported E-text. Committing to these guidelines will allow Alberta to take a national and international lead in transforming and improving accessibility of learning for all students.

The criteria within these guidelines are organized around three broad functions:

- creating student engagement
- building student understanding
- displaying information.

Emerging technologies that have the potential for increasing accessibility of resources in the near-future are described at the end of each of the three sections.

These guidelines are flexible, and should be mixed and matched to align with the needs of specific groups and individual students and the task demands of specific learning outcomes and contexts.

These accessibility guidelines combine the principles of universal design with the principles of user-centred design to create criteria that will benefit all users. The focus of these guidelines is student resources, but ideally, any resources developed for other audiences, including teachers and parents, would benefit from the use of these design principles.

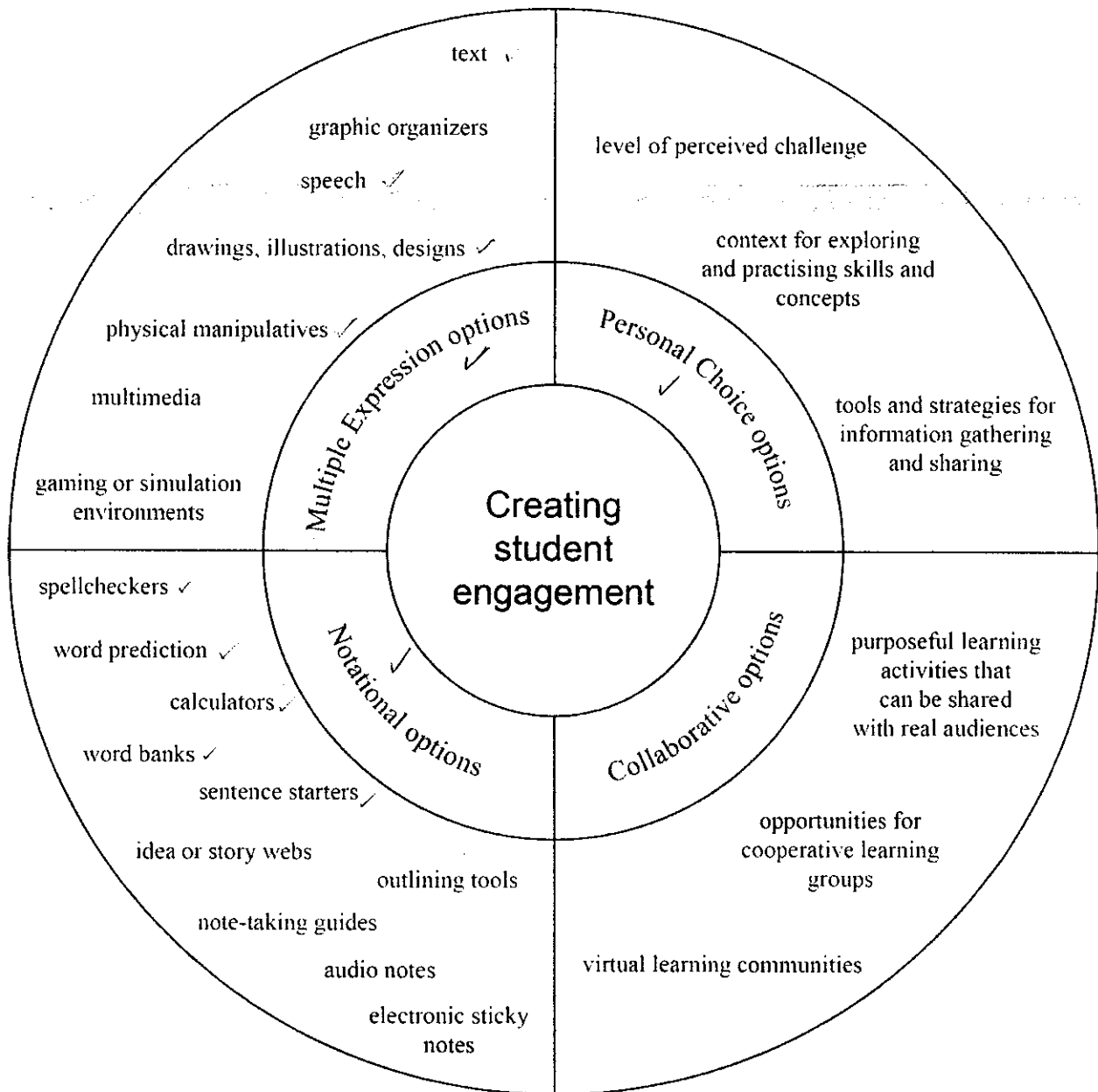
The success of this vision depends on collaboration across the Education Ministry and across school jurisdictions and other learning environments, as well as collaboration between publishers, developers and researchers in the fields of accessibility, instructional design and learning theories. Through collaborative effort, Alberta can create a new model of accessible resources for all students.

A note about the illustrative examples

The following criteria are illustrated by links to various websites and software demonstrations. These examples are for demonstration and discussion purposes only. The overall design or content of these sites and products has not been reviewed. Since these guidelines for accessibility are forward-thinking, there are a limited number of existing digital resources that fully illustrate these guidelines. Some of the examples may be a good demonstration of specific criteria but may still have limited overall accessibility. These websites and products have not been reviewed for alignment with the Alberta programs of study and may not be suitable for use in Alberta classrooms.

A. Creating student engagement

(Multiple opportunities for students to explore, interact with, personalize and reflect on new skills, information and concepts)



A. Creating student engagement (continued)

- **drawings, illustrations, design**

For example:

Kid Pix software is a drawing program developed for children and has a number of features including realistic art tools, slide shows, and digital puppets. It also includes teacher tools.

http://web.riverdeep.net/portal/page?_pageid=818,1384169,8181384199&_dad=portal&_schema=PORTAL

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- **physical manipulatives**

For example:

The National Library of Virtual Manipulatives at the Utah State University offers virtual manipulatives such as a geoboard for constructing 3-D shapes.

http://www.nlvm.usu.edu/en/nav/frames_asid_277_g_1_t_3.html?open=activities&from=topic_t_3.html

Use the Kids' Poetry Page below to manipulate words to create a poem in this online version of Magnetic Poetry.

<http://www.magpo.com/kidspoetry/createpoem.cfm?kit=5>

At the ArtsAlive Virtual Dance Studio, students can compose a dance phrase and then bring it to life.

<http://www.artsalive.ca/en/dan/yourturn/virtualdance/default.asp>

SketchUp is a new freeware that offers students opportunities to design and create 3-D animated manipulatives to illustrate their learning.

<http://sketchup.google.com/>

☒ universal

- **multimedia (e.g., slide presentations, videos, webpages, storyboards, comic strips)**

For example:

Scratch is a new programming language that students can use to create interactive stories, animations, games and art—and share their creations on the web. Visit the Scratch website and click on second demo screen on the right to see the potential of this MIT-developed language.

http://info.scratch.mit.edu/About_Scratch

The Readwritethink site offers an electronic tool for designing comic strips.

<http://www.readwritethink.org/materials/comic/>

Pixton is a free design software that offers students opportunities to create comic strips.

<http://pixton.com/ca/>

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A. Creating student engagement (continued)

- **tools and strategies for information gathering and sharing**

For example:

There are many free and subscription based tools available online for taking, organizing and sharing notes, pictures and screenshots. One example is the Evernote.

http://www.evernote.com/about/what_is_en/

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3. **NOTATIONAL options** provide ways for students to work with the text, including making notes on or from the text. These tools need to match students' abilities and the task demands, and can include such features as:

- ✓ • **spellcheckers**

For example:

Many standard word processing programs have spellcheck features. See the demo for the Ginger software below or submit a sentence of your own for correction. This spellcheck program handles phonic errors.

www.gingersoftware.com

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- **word prediction**

For example:

TextHelp's Read & Write 9 software offers a number of accessibility features, including a word prediction feature.

<http://www.spectronicsinoz.com/product/22410/popup>

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- **calculators**

For example:

There are many free sites that offer online versions of calculators.

<http://www.calculator.com>; <http://www.calculateforfree.com>

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- **word banks**

For example:

See the Crick Software site below to view an example of what a word bank might look like.

<http://www.learninggrids.com/uk/WriteOnlinePage.aspx?view=tour>

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A. Creating student engagement (continued)

4. **COLLABORATIVE options** provide tools for students to work and share with other students and/or audiences (Anderson-Inman and Horney, p.154). For many students, the option of working collaboratively is an effective way to build and sustain engagement in learning activities and projects. This could include:

- **authentic and purposeful learning activities that can be communicated to real audiences**

For example:

There are a number online publishing opportunities for students to showcase and share their learning. The Teaching Matters website offers a number of samples and opportunities for both teachers and students.

<http://write.teachingmatters.org>

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- **opportunities for cooperative learning groups**

For example:

There is much information on the web for integrating cooperating learning groups into classroom instruction. Saskatoon's Instructional Strategies Online offers a self-guided tutorial that outlines opportunities for cooperative learning groups.

<http://olc.spsd.sk.ca/DE/PD/coop/index.html>

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- **construction of virtual communities of students engaged in common interests or activities.**

For example:

On the EcoKids site students can click on the "Have your say" tab and share their opinions about a particular environmental issue with kids around the world.

http://www.ecokids.ca/pub/kids_home.cfm

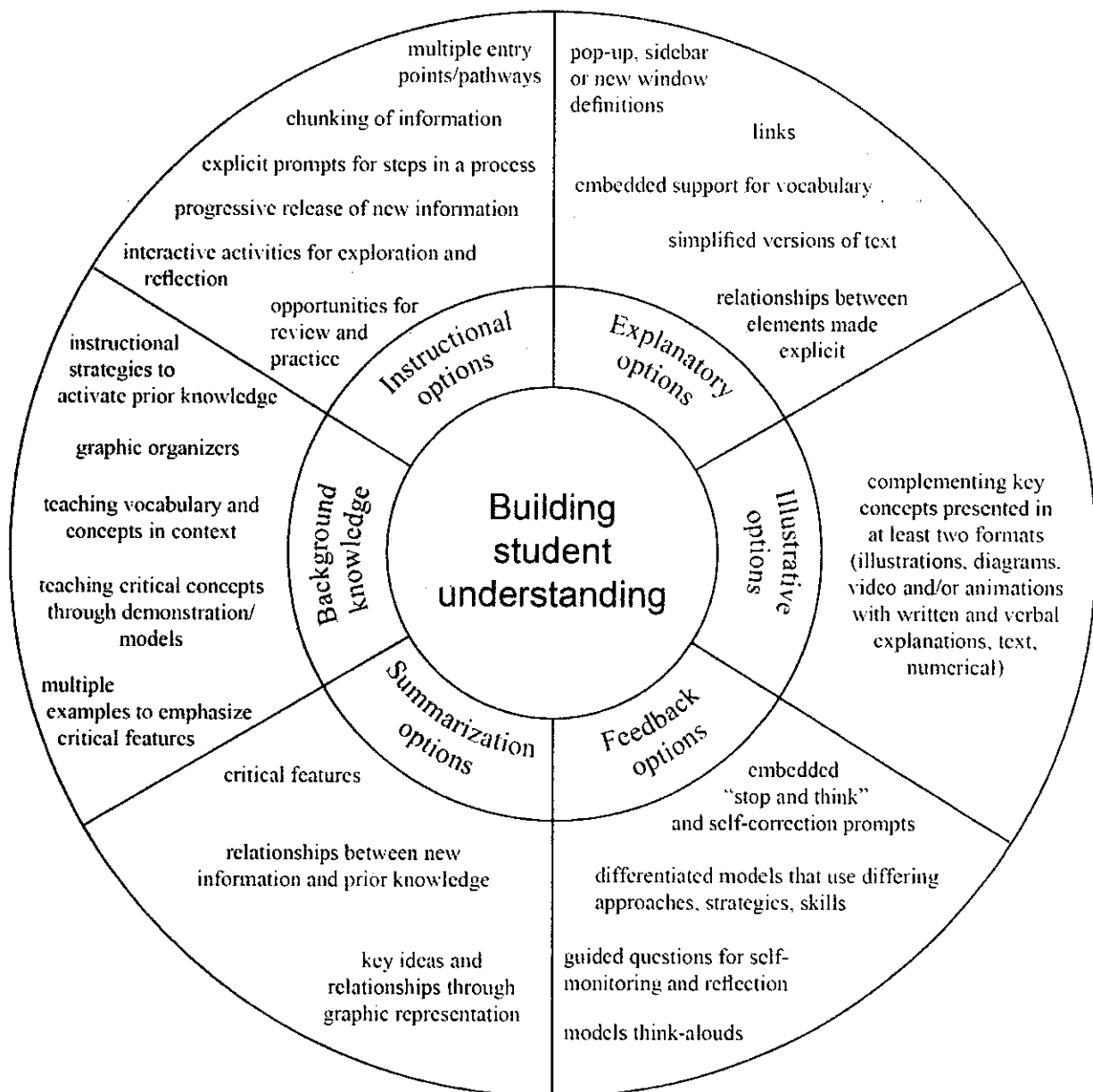
Students can join a collaborative online project at the Eleanor Rigby project to learn more about homelessness.

<http://www.masters.ab.ca/bdyck/Homeless>

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B. Building student understanding

(Multiple means of providing instruction, explanation, illustration, summarization and feedback)



B. Building student understanding (continued)

- **providing multiple examples to emphasize critical features.**

For example:

Use the online version of the Merriam Webster Visual Dictionary to access information on racquet sports. Visuals can be clicked on to find more detailed information.

<http://visual.merriam-webster.com/sports-games/racket-sports.php>

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2. **INSTRUCTIONAL options** provide prompts, questions, strategies or instruction designed for learning new skills, information or concepts (Anderson-Inman and Horney, p. 154). These options could incorporate:

- **multiple entry points and pathways through learning activities and content**

For example:

The Anneberg Media site below offers various tabs and links for students to choose how they will move through the site.

<http://www.learner.org/interactives/dynamicearth/index.html>

The PBS site below allows users to enter through the diagram or through the links at the bottom of the diagram.

<http://www.pbs.org/wgbh/nova/lasalle/shipwreck.html>

The WebMATH site below offers several ways to enter a learning activity.

<http://www.webmath.com>

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- **chunking of information into smaller elements**

For example:

The Math Open Reference allows users to choose “Next” for single step directions or “Run” for full sequence.

<http://www.mathopenref.com/constparallel.html>

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- **explicit prompts for each step in a sequential process**

For example:

The Hotmath.com site offers detailed step-by-step explanations of a number of mathematics equations and processes.

http://hotmath.com/tutor/?pid=samples_1_1_SampleExercises_Algebra-Sample_1

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B. Building student understanding (continued)

Definitions can also be delivered in a variety of ways including:

- **pop-up (that appear as the mouse floats over the word) or sidebar definitions**

For example:

The diagram of volcanoes and colliding tectonic plates on Anneberg Media's site offers pop-up definitions.

<http://www.learner.org/interactives/dynamicearth/slip2.html>

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- **definitions in a new window (that appear when students click on a word)**

For example:

The Windows to the Universe site offers definitions for underlined terms.

<http://www.windows.ucar.edu>

☒ universal

- **links (that take students to a new page that might be either a glossary or definition format or include a tool for translating English words and phrases into another language).**

For example:

The WordAhead site offers vocabulary videos. Enter the word "resilient" in the right-hand search box to see a demo.

<http://www.wordahead.com/Home/tabid/37/Default.aspx>

The HubbleSite Black Holes site has an encyclopedia tab that also takes students into a glossary (at the bottom of the screen). The glossary also offers additional links and questions.

http://www.hubblesite.org/explore_astronomy/black_holes/modules.html

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Explanatory features can:

- **embed support for vocabulary and symbols within the text (e.g., hyperlinks or footnotes to definitions, explanations, illustrations, previous coverage)**

For example:

The CAST model books offer an embedded glossary.

<http://bookbuilder.cast.org/model.php>

☒ universal

B. Building student understanding (continued)

Illustrative options should make the information in text easier to understand by:

- **complementing key concepts presented in one text or numerical form (e.g., a written explanation or a math equation) with an alternative form (e.g., an illustration, diagram, model, video, comic strip, storyboard, photograph, animation, interactive)**

For example:

On the Maricopa Community College website, the equation for photosynthesis is translated into words and supported with visuals.

<http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookPS.html>

The Exploratorium website offers three ways for students to get the directions for the “Bottle Blast-Off” activity: video, PDF text instructions (listed as Activity) and PDF concept map.

<http://www.exploratorium.edu/afterschool/activities/index.php?activity=134&display=further>

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- **complementing key concepts presented in illustrations, diagrams, video and/or animations with written and verbal explanations.**

For example:

The Annenberg Media Interactives Dynamic Earth website offers a variety of visuals paired with text to support student understanding.

<http://www.learner.org/interactives/dynamicearth/slip2.html>

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5. **SUMMARIZATION options** provide condensed ways of viewing information. One of the most effective ways to make information more accessible is to provide explicit cues and prompts that assist students in attending to those features that matter the most. Summarization options highlight:

- **critical features**

For example:

The University of Kentucky website offers visuals and facts to identify local trees.

<http://www.uky.edu/Ag/Horticulture/kytreewebsite/Leaves/leafcollection.htm>

This geometry site from Interactives at Learner.org offers visuals of the critical features that distinguish one geometric form from another.

<http://www.learner.org/interactives/geometry/3d.html>

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B. Building student understanding (continued)

- **differentiated models that demonstrate the same outcomes but use differing approaches, strategies, skills**

For example:

After allowing students to design and test their own roller coaster, the Amusement Park Physics interactive on the Learner.org site provides differentiated feedback.

<http://www.learner.org/interactives/parkphysics/>

After allowing students to make their own food choices, the “Rate Your Plate Activity” on the University of Connecticut website gives students four different options for rating their choices.

<http://sp.uconn.edu/~cthompso/game.html>

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- **guided questions for self-monitoring and reflection**

For example:

The Family Support Network of North Carolina offers an electronic Reflections Log that provides questions to reflect on learning sessions with a mentor.

<http://fsnnc.med.unc.edu/services/Mentor/reflectionlogs.htm>

The robotics study on the Galileo.org site offers thought-provoking questions for students to assess their work.

<http://www.galileo.org/robotics/index.html>

☒ universal



Emerging Technologies with Promise

Digital tutor or learning guides (sometimes called “pedagogical agents” in the new research) are available for “hire” that students can set the parameters for how and when they work. These tutors can evaluate the student’s understanding and adapt the learning activities accordingly. They can prompt students to interact by asking questions, offering encouragement and giving feedback. They can also offer relevant information, provide memorable examples, interpret student responses and even tell a clever joke or two.

For example:

Stanford University website offers an information page on emerging research on pedagogical agents. <http://ldt.stanford.edu/~slater/pages/agents/main.htm>

☒ specialized

C. Displaying Information (continued)

Students differ in the ways they perceive and comprehend information that is presented to them. To reduce barriers to learning, it is important to ensure that key information is equally perceptible to all students by providing:

- information in a format that will allow for adjustability by the user (e.g., text that can be enlarged, sound that can be amplified, links and/or buttons to turn features off)
- the same information through different sensory modalities (e.g., through vision, by hearing, or touch).

1. **CONTENT ORGANIZATION** affects how students attend to text, interact with ideas contained in the text and how engaged they are with the information presented. To be most accessible to the broadest range of students, content needs to be concise, tightly organized and it needs to capture the student's attention from the very first line. Content organization should:

- | | |
|---|---|
| • include a short summary of the entire content | <input checked="" type="checkbox"/> universal |
| • begin with familiar and easy material and then move to newer and more difficult material | <input checked="" type="checkbox"/> universal |
| • use simple sentences (seldom more than 20 words) | <input checked="" type="checkbox"/> universal |
| • use shorter, more familiar words versus longer, less familiar words | <input checked="" type="checkbox"/> universal |
| • define any special terms used | <input checked="" type="checkbox"/> universal |
| • chunk texts into short paragraphs of two to five sentences | <input checked="" type="checkbox"/> universal |
| • use meaningful, descriptive titles, headings and subheadings of less than five words | <input checked="" type="checkbox"/> universal |
| • use different initial key words in each heading (for ease of scanning) | <input checked="" type="checkbox"/> universal |
| • use graphics thoughtfully | <input checked="" type="checkbox"/> universal |
| • use bullets to organize three or more points in a logical way. | <input checked="" type="checkbox"/> universal |

C. Displaying Information (continued)

- **the ability to pause, stop, fast forward and replay video, animation, sound, simulations, etc.**

For example:

The McCord Museum website has an animated slide show with pause and rewind buttons so the user can control the slide show pace. Click on “Animated View” in the top right hand corner.

http://www.mccord-museum.qc.ca/en/keys/webtours/VQ_P2_2_EN

This video on the Special Needs Ontario Window (SNOW) site offers students a number of ways to control the video, including a play, stop, rewind, skip back and skip ahead buttons. The videos are also divided into three parts, reducing the download time and size.

http://snow.utoronto.ca/index.php?option=com_content&task=view&id=312&Itemid=217

☒ universal

- **number of features or items presented at a time**

For example:

The Northeast Alberta Community Board of Persons with Developmental Disabilities has a very simple website that uses links, graphics, and multiple versions of documents like Summary, Detailed Summary and Simple Language.

<http://www.ne-pdd.org>

The BBC website offers many features under the Display Options selection at the top of the screen. In Display Options, users can choose to customize or select from a preset menu. Customize options include adding or removing items from a page view as well as customizing colour and size of text.

<http://www.bbc.co.uk/>

☒ universal

- **length of work session (e.g., no time limit).**

For example:

For maximum accessibility, timed events should only be used when absolutely necessary. When used, there should be a prompt for more time. Ideally, there should be no time limit as a survey below from Service Canada demonstrates.

<http://alis.alberta.ca/hs/cp/cpt/planning-tools.html>

☒ universal

3. **TRANSLATIONAL options** provide a one-to-one equivalent or simplified version that is more accessible or familiar to the reader. These options may focus on a word, phrase, paragraph, picture or whole document. It may translate the content into the same or different medium (Anderson-Inman and Horney p.154). Translational options could include:

C. Displaying Information (continued)

- **spoken or text descriptions for all graphics, video or animations.**

For example:

SET-BC has training modules with narration and a clickable Notes tab with a text transcript of the narration.

<http://breeze.setbc.org/p59661438>

The digNubia site offers alternate versions including captioning, descriptive video and graphic pages. Some of these features require turning specific features of your browser on or off. See the Accessibility area of this site for a description of the alternatives offered.

<http://www.dignubia.org/siteaccess.php>

Musée Armand-Frappier has a cartoon audio-visual animation that also has a text-based html version available.

<http://www.musee-afrappier.qc.ca/en/index.php?pageid=3411&page=3411-investigations-9-12-e>

For an example of descriptive text, see the sample from the television show *Stargate SG1*, posted on the Galaviz and Hauber Productions website.

http://www.gandh.ca/sample_3.html

The ITV website offers children's stories with visuals, open captioning, narration and British sign language. The link below demonstrates this multimodal storytelling with the children's classic *Six Dinner Sid*.

http://www.signedstories.com/world/browseall/index.cfm#/player/Six_Dinner_Sid?search=Six%20Dinner%20Sid

☒ universal
☒ specialized

4. **NAVIGATIONAL options** provide features and tools that allow the student to move within a resource or between resources (Anderson-Inman and Horney, p.154). Navigational options include features that:

- **have multiple entry points**

For example:

On the PBS Voyage of Doom website, users can enter through the printed text on the graphic, section headings, or through navigational topics at the bottom of the screen. Tabs at the top take users to related parts of the website.

<http://www.pbs.org/wgbh/nova/lasalle/>

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C. Displaying Information (continued)



Emerging Technologies with Promise

Display of information in a simpler version, supported by graphics and/or in alternate formats such as outlines, slide presentations or graphic organizers.

For example:

Wikipedia has a number of entries in Simple English. To explore the features of this language, find the entry for "bear" at <http://en.wikipedia.org/wiki/Bear>. Then choose "Simple English" from the left-hand language bar and go to <http://simple.wikipedia.org/wiki/Bear>. Compare the two versions.

☒ universal

☒ targeted

References (continued)

Pernice, Kara and Jakob Nielsen. "Beyond ALT Text: Making the Web Easy to Use for Users with Disabilities: 75 Best Practices for Design of Websites and Intranets, Based on Usability Studies with People Who Use Assistive Technology." *Nielsen Norman Group*. 2001. <http://www.nngroup.com/reports/accessibility/> (Accessed October 2008).

Rose, David H. and Meyer, Anne. *Teaching Every Student in the Digital Age: Universal Design for Learning*. Alexandria, VA: Association for Supervision and Curriculum Development, 2002.